REMARKS

Claims 1 – 4 are pending in this application and the following remarks are presented in support of patentability of these claims.

In a Final Office Action mailed 12 July 2007, claims 1 and 2 have been rejected under 35 USC 103(a) as being unpatentable over Cheng (US Patent No. 7,051,104 B1, hereinafter "the Cheng Patent") in view of Dang et al. (US Patent No. 7,035,209 B2, hereinafter "the Dang Patent"). Additionally, claims 3 and 4 have been rejected under 35 USC 103(a) as being unpatentable over Cheng in view of Dang, and further in view of Hatta (US Patent No. 5,506,839, hereinafter "the Hatta Patent"). In rejecting Applicants' claims, the Examiner noted:

> Consider claim 1, Cheng disclose a (data communication) system operating in ISDN data link layer protocols Q.921 (LAP-D) and Q.922 (LAP-F) that maintains active connection between two terminals/access nodes and that all switched virtual circuits (SVC) are still established during a down or re-initialization, which may include a software reset (column 5, lines 39-55). Cheng further discloses the exchange of ITU Q.921 and Q.922 request signals (e.g. TEI, SAMBE, AWAITING_UA/DM, DL-ESTABLISH, DR-RELEASE, etc.) between a data terminal equipment (DCE) (sic) [DTE] and a data communication equipment (DCE) to maintain a predetermined active data call connection state (column 5, lines 26-55 and column 6, lines 25-30). However, Cheng may not have explicitly mentioned maintaining the presence of an active data link between the two nodes (ISDN Access Node and Terminal Equipment) and by forcing a predetermined data call to prevent interruption of the data link connection. In the same field of endeavor, Dang et al disclose a Control Network Automatic Creation - CNAC-process in each (terminal) node that can maintain data link connection between nodes (therefore, maintaining a presence of data link) and replaces disrupted links using available bandwidth of in-band links (therefore forcing a predetermined active data call connection) between the nodes (column 8, lines 65-67 & column 9, lines 1-3, claim 15, fig. 2). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the teachings of the presence of an active data link between the two nodes (ISDN Access Node & Terminal Equipment) and a predetermined data call to prevent interruption of the data link connection as taught by Dang et al, in the system of Cheng, in order to sustain network reliability.

Applicants have reviewed the cited references and the Examiner's stated grounds of rejection, and present the following remarks in support of patentability.

The Cheng Patent discloses a system and method for extending and modifying the ITU Q.922 LAPF disconnect logic to remedy or alleviate unsynchronized virtual circuit establishment instances between a first device and a second device. The method generally includes transmitting a disconnect request message to the first device in response to a data link establish request and transmitting a request for connection to establish link message to the second device upon one of expiration of an awaiting-response timer, receiving a disconnect mode message from the second device, and receiving an acknowledgement message from the second device.

As noted in Cheng, column 1, lines 56 – 65:

> … if either end of an LAPF link between a user device and a peer device providing a connection to a Frame Relay network goes down and comes back up, it is assured that both ends of the link understand that all virtual circuits have been torn down or released. The extension provided by the present invention may be implemented at either or both ends of the link. Protection against unsynchronized virtual circuit establishment instances is provided if the end that goes down and comes back up is equipped with the extension.

This is explained in more detail in column 4, lines 35 – 38, and the following description:

> Recommendation Q.922 allows for and does not resolve the problematic instances of unsynchronized SVC establishment as described below. In particular, there may be circumstances when an LAPF link to a device goes down. The LAPF may go down when the device brings down the LAPF link, such as when there is an internal system error or a system reload, or when the device determines that the LAPF link is down, such as in response to the physical line being down.

Once the physical link goes down and then comes back up again (see Fig. 6), the system loses the synchronization between the virtual circuits (SVC) that are implemented at either end of the link. It is this lack of synchronization that the Cheng Patent addresses.

The Dang Patent discloses a communications network in which the plurality of switching nodes maintains separate data and control links between itself and each of at least two adjacent switching nodes. If a control link is not present between two adjacent nodes, available unused bandwidth on the corresponding data link is used to create a control link. This basic network configuration is described in the Deng Patent in column 3, lines 10 – 15:

> Referring to FIG. 1, a simple optical communications network is illustrated as comprising a plurality of, in this example six, nodes 10, identified individually as Node 1 to Node 6, and a network management station (NMS) 12, which are coupled together via optical communications paths or links represented by solid and dashed lines.

Furthermore, the use of parallel data and control links is noted in column 3, lines 27 – 34:

> The optical communications paths or links represented by solid and dashed lines in FIG. 1 comprise data or in-band links 14, represented by solid lines and serving primarily for carrying data or user traffic, and control or out-of-band links 16, represented by dashed lines and serving for carrying control traffic as explained above. The data links 14 and control links 16 are subsets of the overall set of communications links of the communications network.

The control links of the Control Network are maintained separate from the data links by the use of a Control Network Automatic Creation process, which is described in column 4, lines 5 – 20:

> This CNAC process allows the nodes 10 of the network to automatically create and maintain the control network with a topology, or subset of control traffic links, that provides for the control traffic and for redundancy so that, to a reasonable degree, the control network can be maintained despite failures in the communications network. Thus the control network is automatically created and maintained with a desirable level of reliability. If, for example as in the case of Node 6 in FIG. 1 as described below, the CNAC process can not be satisfied for a particular node, an alarm can be provided to alert a network operator to this situation.
>
> In accordance with this CNAC process, each node is required to have at least one control network link (i.e. path of the control network for control traffic) to each of its adjacent or neighbour nodes, and to have at least two adjacent or neighbour nodes.

The operation of the CNAC process is described in column 4, line 64 – column 5, line 4:

> If the CNAC process is enabled for this node as determined at the block 22 in FIG. 2, then as indicated at a block 23 the node compares its control network neighbour list with its base neighbour list. In a subsequent decision block 24 the node 10 determines whether all of the adjacent nodes in the base neighbour list are also present in the control network neighbour list, i.e. whether the control network neighbour list completely contains the base neighbour list.

Further, in column 5, line 49 – column 6, line 13:

> If there are not at least two such neighbour nodes in the base neighbour list, then at a block 26 an alarm is generated and then the return block 22 is reached. In the example of FIG. 1, this would be the case for Node 6, which has only one neighbour

node. The alarm serves to indicate to a network operator that the CNAC process has not met its requirements as described above, and this alarm can be investigated in known manner.

Conversely, if it is determined in the decision block 24 that at least one node identified in the base neighbour list is not present in the control network neighbour list, then in a decision block 27 the node determines, for example as further described below, whether there is at least one available in-band, i.e. data or user traffic, link 14 to this node with sufficient bandwidth to be used as a control network link. If not, then the block 26 is again reached to generate an alarm indicating a failure of the automatic process to create the control network in accordance with its requirements, and again a return is made via the block 22.

If, however, there is at least one available in-band link with sufficient bandwidth, then a block 28 is reached in which an in-band or data link is selected (in a manner for example as described below) to provide the desired control network link, the respective node identified in the base neighbour list is consequently added to the control network neighbour list, and a loop is made back to the decision block 24. The CNAC process of FIG. 2 thus continues until the control network is automatically created, in accordance with its requirements as described above, for this node, or the automatic creation process fails to meet the requirements and an alarm is generated accordingly.

Thus, **the Dang Patent is directed exclusively to maintaining control links between adjacent switching nodes in a network; and when a control link goes down, a new control link is established, even if this requires acquiring bandwidth for an associated data link that spans the two switching nodes**.

However, the Dang Patent fails to disclose or even hint at the presence of Terminal Equipment, or preventing a data link from going down by ***forcing*** the terminal equipment into a predetermined active data call connection state. In fact, **the Dang Patent fails to even hint at what remedial actions are taken by the network when a data link goes down, since it is exclusively directed to maintaining control links between adjacent switching nodes in a network**.

In contrast, Applicants' data link layer maintenance system prevents the data link from going down by ***forcing*** the terminal equipment into a predetermined active data call connection state. Applicants' data link layer maintenance system executes in the Q.921 protocol server of the serving ISDN Access Node and maintains the data link layer active in the ISDN-based Terminal Equipment and the Q.921 protocol server of the serving ISDN Access Node during the execution of a software reset process, and thereby prevents the data link from going down. This is accomplished by the Q.921

protocol server of the serving ISDN Access Node software storing the data communications connection data in a persistent table that survives the software reset operation. A predetermined set of control signals then is exchanged between the Q.921 protocol server of the serving ISDN Access Node and the ISDN-based Terminal Equipment in response to the initiation of a software reset process to execute standard signaling processes of the LAP-D protocol to force the Terminal Equipment and the Q.921 protocol server of the serving ISDN Access Node into a predetermined stable state.

Thus, Applicants' data link layer maintenance system addresses an entirely different problem than the cited Cheng Patent: Applicants' system prevents the data link from going down by forcing the terminal equipment into a predetermined active data call connection state, while the Cheng Patent addresses remediation of the switched virtual circuits (SVC) after the data link has gone down and synchronization of these switched virtual circuits is lost. Applicants' data link layer maintenance system also addresses an entirely different problem than the cited Dang Patent: Applicants' system prevents the data link from going down by forcing the terminal equipment into a predetermined active data call connection state, while the Dang Patent addresses restoration of the control links between switching nodes in a network after the control link has gone down.

Neither reference even hints at Applicants' novel structure recited in independent claim 1: "data link layer state means, responsive to the initiation of a software reset operation in said terminal equipment and the presence of an active data link between said ISDN Access Node and said terminal equipment, for **forcing said terminal equipment into a predetermined active data call connection state**;" or "state maintenance means for **exchanging call connection signals with said terminal equipment to maintain said terminal equipment into a predetermined active data call connection state and to prevent interruption of said active data link between said ISDN Access Node and said terminal equipment**." Therefore, the cited references, individually and in combination, fail to show, suggest, or even hint at the structure specifically recited in Applicants' independent claim 1. Applicants, therefore, believe that claim 1 is allowable under 35 USC 103(a) over the Cheng Patent in view of the Dang Patent for the reasons noted above. Applicants believe that

claim 2 is allowable under 35 USC 103(a) over the Cheng Patent in view of the Dang Patent, since this claim depends on an allowable base claim.

The Examiner also rejected claims 3 and 4 under 35 USC §103(a) as unpatentable over the Cheng Patent in view of the Dang Patent, and further in view of the Hatta Patent.

The Hatta Patent discloses a congestion control method adapted to a communications system having a network, a terminal, and a terminal adapter which is provided between the network and the terminal and interchanges a first frame format handled by the network and a second frame format handled by the terminal; the terminal adapter receives a signal sent in the first frame format via the network and detects whether or not the signal includes congestion notification information indicating occurrence of a congestion in the communications system. The terminal adapter then sends a signal in the second frame format including first notification information to the terminal. The terminal adapter then performs a predetermined control process for recovery from the congestion when the terminal receives the signal in the second frame format.

Applicants believe that claims 3 and 4 are allowable under 35 USC §103(a) over the cited Cheng Patent, Dang Patent, and Hatta Patent, since these claims depend on an allowable base claim.

In view of the above remarks, Applicants believe the pending application is in condition for allowance. Applicants believe no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 50-1848, under Order No. 013436.0268PTUS from which the undersigned is authorized to draw.

Respectfully submitted,
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